**Before the**
**Federal Communications Commission**
**Washington, DC 20554**

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| In the Matter of | ) | |
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| Improving Public Safety Communications in the 800 MHz Band | ) | WT Docket No. 02-55 |
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| | ) | |
| Consolidating the 900 MHz Industrial/Land Transportation and Business Pool Channels | ) | |
| | ) | |

To: The Commission

**REPLY COMMENTS**


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## SUMMARY

Surprisingly, given the breadth of interested parties in this proceeding, a review of the comments shows the development of a general consensus. This consensus coalesces around the following points:

- *Causes of interference*. Receiver overload and intermodulation are generally recognized as more prevalent than transmitter sideband noise. No one disputed that the types of interference match those in the *Notice* and the *Best Practices Guide*. There was near unanimity that Nextel is the primary cause of interference.

- *Solving interference*. Improving public safety's receiver front-ends and spectrally separating public safety from low site CMRS are the ways in which interference could be alleviated or eliminated.

- *Nextel Proposal*. There is overwhelming opposition to the Nextel plan, including opposition from the public safety community. Importantly, the proposal will not solve receiver overload or intermodulation. Moreover, it is viewed as the most disruptive, the most self-serving (Nextel would be swapping more congested interleaved spectrum for contiguous nationwide spectrum), the most time consuming, and the most costly of all the proposals in the *Notice*.

- *Other 800 MHz Rebanding Proposals*. No 800 MHz rebanding plan will solve all public safety interference. Receiver overload and intermodulation will continue due to the wide front-end of public safety receivers. To different degrees, all such plans would be difficult, time consuming, costly and disruptive, and would require "green field" (open or vacated) spectrum to be implemented.

- *Short-Term Solution*. Immediate actions that can and should be taken include: (i) continued case-by-case resolution of interference by affected parties at the local level; (ii) use of the corrective actions set forth in the *Best Practices Guide*; (iii) facilitation of negotiated rechannelization plans where necessary; and (iv) continued documentation of interference and methods used to alleviate it.

- *Best Long-Term Solution: 700 MHz Band*. A substantial number of parties advocate the reallocation of the upper 700 MHz band to public safety and the relocation of 800 MHz public safety licensees to the 700 MHz band. By funding the relocation with proceeds from the auction of vacated 800 MHz spectrum, the 700 MHz band offers the best, most complete long-term solution to public safety interference in a shorter time frame than the other proposals. It also would afford additional spectrum for public safety, some of which can be used for Homeland Security, Priority Access Service, and/or critical infrastructure needs. While the proposal requires legislation to be fully implemented, given the breadth of support for this plan (as evidenced in comments filed by public safety, SMR, private wireless, satellite and commercial wireless), as well as recent legislative action delaying the auction until a plan can be devised, it can be accomplished.

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To: The Commission

**REPLY COMMENTS**

ALLTEL Communications, Inc., AT&T Wireless Services, Inc., Cingular Wireless LLC, Coupe Communications, Inc., First Cellular, Nokia Inc., Southern LINC, and United States Cellular Corporation (collectively, "Commenters") hereby reply to the comments submitted in response to the Commission's *Notice of Proposed Rulemaking* seeking solutions to interference to public safety systems in the 800 MHz band.[1] As discussed below, Commenters agree with the substantial number of parties who advocate reallocating the upper 700 MHz band to public safety, and relocating 800 MHz public safety licensees to the 700 MHz band, as the best long-term solution to public safety interference. In the interim, Commenters support the continued resolution of interference on a case-by-case basis at the local level using techniques set forth in the *Best Practices Guide*, coupled with the ability to negotiate and obtain Commission approval of channel swaps where necessary.

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[1] *See Improving Public Safety Communications in the 800 MHz Band*, WT Docket No. 02-55, *Notice of Proposed Rulemaking*, FCC 02-81 (rel. Mar. 15, 2002) ("*Notice*"), *summarized*, 67 Fed. Reg. 16351 (Apr. 5, 2002).

## I. CAUSES OF INTERFERENCE.

Comments indicate that receiver overload, intermodulation and transmitter sideband noise, consistent with those set forth in the *Notice* and the *Best Practices Guide*,[2] are the major causes of interference to public safety users[3]. Many commenters agree that receiver overload and intermodulation are generally more prevalent than transmitter sideband noise.[4]

Receiver overload occurs when a receiver amplifies an undesired signal it is receiving.[5] It is recognized as a major cause of interference "because public safety radios are designed to have a wide front end due to the broad range of frequencies that have been allocated to public safety. As such, they 'see' a lot of frequencies outside those assigned to them . . . ."[6] Intermodulation is another significant cause of interference, and occurs "when two or more signals operating at different frequencies combine to produce new signals, called intermodulation products, at different frequencies."[7] As is the case with receiver overload, "the wide front end design of the public safety radios, combined with limitations of the low noise amplifier, are

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[2] *See Notice* at ¶ 15 (citing *Avoiding Interference Between Public Safety Wireless Communications Systems and Commercial Wireless Communications Systems at 800 MHz – A Best Practices Guide*, Dec. 2000 ("*Best Practices Guide*"), available at <http://wireless.fcc.gov/publicsafety>); *see also, e.g.,* Comments of Fairfax County Department of Information Technology ("Fairfax") at 5; City of Ft. Lauderdale, Florida ("Ft. Lauderdale") at 1, 4-5; Kenwood Communications Corporation ("Kenwood") at 3.

[3] Commenters note that other 800 MHz licensees are also experiencing interference.

[4] *See, e.g.*, Comments of AT&T Wireless Services, Inc. ("AT&T") at 18; Cingular Wireless LLC and ALLTEL Communications, Inc. ("Cingular/ALLTEL") at 4-6; Southern LINC at 12-13; Verizon Wireless at 4-5.

[5] Comments of Southern LINC at 12.

[6] Comments of Cingular/ALLTEL at 4.

[7] Comments of Verizon Wireless at 5.

responsible for the generation of undesired intermodulation products."[8] Transmitter sideband noise, or out of band emissions, is a less significant contributor to public safety interference because the low level of commercial emissions is generally insufficient to degrade public safety performance.[9] To the extent it is a problem, it is more likely to occur "where public safety licensees and Nextel are interleaved."[10]

Among those commenters addressing the issue, there was near unanimity that Nextel is the primary source of interference to public safety systems. Cellular radiotelephone service ("cellular") providers, other enhanced specialized mobile radio ("ESMR") providers, and business, industrial and land transportation ("B/ILT") licensees operating within 800 MHz are glaringly absent as contributors to such interference.[11] This is the case for a variety of reasons. First, as noted above, Nextel's location in the interleaved spectrum results in a greater likelihood

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[8] Comments of Cingular/ALLTEL at 6.

[9] *See* Comments of Verizon Wireless at 6.

[10] *Id*. at 6.

[11] *See, e.g.*, Comments of Ad Hoc Wireless Alliance ("Ad Hoc Wireless") at 7; American Water Works Association ("American Water") at 2; Aeronautical Radio, Inc., United Airlines Inc. *et al*. ("ARINC") at 26 n.37; AT&T at 6; City of Baltimore, Maryland ("Baltimore City") at 2; Baltimore County Office of Information Technology ("Baltimore County") at 3; Boeing Company ("Boeing") at 8; Carolina Power and Light Company ("Carolina") at 6; Cascade Two Way Radio ("Cascade") at 2; Cinergy Corporation ("Cinergy") at 31; Cingular/ALLTEL at 2; Commercial Radio and Television, Inc. ("CRT") at 3; Consumer Energy Company ("Consumer Energy") at 9-10; Delmarva Power & Light Company and Atlantic City Electric Company ("Delmarva") at 10, 22; Entergy Corporation ("Entergy") at 11, 25; Exelon Corporation ("Exelon") at 7; Ft. Lauderdale at 2; King County Information and Technology Services Division ("King") at 2; National Association of Manufacturers and MRFAC ("NAM") at 2; Preferred Communications Systems, Inc. ("Preferred") at 2, 7; SCANA Corporation ("SCANA") at 9; Skitronics LLC ("Skitronics") at 21; South Plains Communications ("South Plains") at 1; Southern LINC at 58; Supreme Radio ("Supreme") at 4; Verizon Wireless at 2*; see also* Comments of Duke Energy Corporation ("Duke") at 6-7.

of out-of-band emissions, particularly given the engineering decisions Nextel has made in the construction and design of its network.[12] Second, *all* of Nextel's channels are encompassed within the passband of public safety handsets, while only a small fraction of the cellular channels are.[13] Finally, Nextel's base stations transmit at full power regardless of whether the channels are in use; unlike cellular, Nextel does not employ dynamic power control to adjust power as needed.[14] As one public safety commenter notes, "Nextel's system architecture and transmission modes are incompatible with the pre-existing LMR technologies and systems in the 800 MHz band."[15]

These factors help to explain why the *Project 39* report cited by the Association of Public-Safety Communications Officials International, Inc ("APCO") concludes that "ESMR sites operated by Nextel or other ESMR operators seem to be the most commonly identified contributing factor" to interference to public safety operations.[16] The APCO report reaches this conclusion even though Nextel is the *only* ESMR operator cited as a cause of interference, with

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[12] *See, e.g.*, Comments of Fairfax at 3; *see* Comments of AT&T at 6; Kenwood at 6; ARINC *et al.* at 14. According to a former Nextel employee, "many technical shortcuts were taken when [the Nextel] sites were constructed. . . . Cavity combiners were replaced with hybrid combiners . . . . Unfortunately, this change along with several others caused the noise floor to increase dramatically at most sites. This is one of the major causes of interference to public safety . . . ." Comments of Danny Hampton ("Hampton")at 1-2.

[13] *See, e.g.*, Comments of AT&T at 6.

[14] *See, e.g.*, *id.*; Fairfax at 4; *see also* Comments of City of Portland, Oregon ("Portland") at 2-7.

[15] Comments of Fairfax at 2 (emphasis removed).

[16] *Project 39, Interference to Public Safety 800 MHz Radio Systems*, Interim Status Report of the Project 39 Technical Committee at 3, Dec. 24, 2001 ("*Project 39*"), available at <http://www.apcointl.org/frequency/project_39>.

the exception of a single case. In comparison, the record indicates that instances of cellular interference and other ESMR interference have been isolated and willingly resolved on a case-by-case basis.[17] Furthermore, beyond Nextel and the scattered instances of interference by other CMRS licensees, there is a stark absence of evidence that any other licensees within the 800 MHz band are causing interference to public safety systems.

## II. PROPOSED SOLUTIONS.

There is consensus on several ways in which interference could be alleviated or eliminated. First, as both the *Notice* and the *Best Practices Guide* recognize, it "is indisputable that the deployment of more interference-resistant public safety handheld and mobile receiver units will help alleviate interference."[18] Because most public safety receivers today "include wide front end receivers which are capable of receiving across the entire private radio 800 MHz band," the most important feature of new or modified receiver units is that they be more "front end" limited.[19] The benefits of improving public safety equipment are recognized within the

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[17] *See, e.g.*, Comments of AT&T at 6-7; Cingular/ALLTEL at 2-3; Cellular Telecommunications & Internet Association ("CTIA") at 6; United States Cellular Corporation ("USCC") at 6-7; Verizon Wireless at 2, 6-8; *see also* of Comments of C & M Communications, Inc. ("C & M") at 4-5 (noting that "cellular carriers have demonstrated a great willingness to resolve each instance on a case-by-case basis . . . . In stark contrast, Nextel has thrown up its hands and suggests a radical idea that would require the expenditure of billions of dollars by all to relieve that interference for which it has shown itself unwilling to take responsibility . . . .").

[18] Comments of Access Spectrum, LLC ("Access Spectrum") at 6 (citing *Notice* at ¶¶ 73-74; *Best Practices Guide* at 12-13); *see also, e.g.*, ARINC *et al*. at 29; CTIA at 7-8; District of Columbia Office of Chief Technology Officer ("DC") at 16; Fairfax at 6; Fresno Mobile Radio, Inc. ("Fresno") at 11; Ft. Lauderdale at 5; City of New York, New York ("NYC") at 7.

[19] Comments of Fresno at 11; *see also* Comments of Private Wireless Coalition at 12; ARINC *et al*. at 29.

public safety community, some of whom encourage such efforts.[20] As one public safety licensee states:

> Public safety licensees and equipment manufacturers also have some responsibility in this matter. Clearly, there are changes that can be made in receiver and system designs that can make 800 MHz public safety radio systems less susceptible to interference from CMRS stations. For example, public safety receiver design improvements may be possible to provide additional protection from strong signal overload, receiver desensitization or intermodulation.[21]

Commenters agree with these parties that receiver front-ends should be improved as one means of reducing interference to public safety systems.

Even with improved receivers, however, there is still the potential for intermodulation interference to public safety users.[22] "Only via removal of the public safety operations from the 800 MHz band can the Commission be assured that any rebanding proposal will be effective," otherwise "interference from intermodulation products will continue to plague public safety operations at 800 MHz."[23] Accordingly, many commenters, including public safety, recognize

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[20] *See, e.g.*, Comments of DC at 16; *see also* Comments of Ft. Lauderdale at 5 ("We do agree that the characteristics of receivers does [sic] play a part in the interference process. The ability of a receiver to reject intermodulation interference and adjacent channel signals plays a significant role in the performance characteristics in high field environments."); NYC at 7 ("New York City recognizes the benefits of making public safety radio equipment more resistant to interference . . . .").

[21] Comments of Fairfax at 6; *see also* Comments of Public Safety Improvement Coalition at 7 (encouraging public safety users to improve their receivers).

[22] *See* Comments of ARINC *et al*. at 29.

[23] Comments of Fresno at 4.

that it is also necessary to separate spectrally public safety from low site CMRS.[24] For example, the Cities of Austin, College Station and Bryan, Texas state that "the predominant root cause of the interference problem is the interleaved channel mix of cellular architecture CMRS systems with the traditional noise-limited systems typically used by public safety."[25] Therefore, "[t]he only effective solution lies in separating the interleaved cellular architecture systems from the noise limited systems by a significant amount."[26]

Against this backdrop, Commenters discuss below their concerns with the Nextel plan and other proposals that focus only on 800 MHz rebanding. As a general matter, none of these proposals offers a complete solution to public safety interference, and none provides an adequate funding mechanism. Instead, Commenters believe that relocating public safety users to the 700 MHz band, coupled with an effective and fair means for compensating relocated public safety licensees, offers the best long-term solution. In the short term, Commenters identify certain steps that can and should be taken immediately to alleviate interference to public safety systems.

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[24] *See, e.g.*, Comments of Ad Hoc Wireless at 3 n.3; City of Austin, Texas ("Austin") at 1; American Petroleum Institute ("API") at 4-5; Cities of College Station, Texas and Bryan, Texas ("College Station") at 1; DC at 4; Fresno at 3-4; NAM at 4; Portland at 8, 12; Southern LINC at 27; Telecommunications Industry Association ("TIA") at 3.

[25] Comments of Austin at 1; College Station at 1.

[26] *Id.* ; *see* Comments of DC at 4 (agreeing that it is necessary to "segregate incompatible operators"); *see also* Comments of NAM at 4 (advocating "significant frequency separation – at least four (4) MHz . . . possibly more").

### A. There Is Overwhelming Opposition to the Nextel Plan.

There is overwhelming opposition to the Nextel plan from all quarters, including B/ILT users, commercial and private wireless licensees, and satellite operators.[27] Notably, the Nextel plan is not uniformly supported by public safety.[28]

As an initial matter, the Nextel plan will not effectively address all forms of interference, particularly receiver overload and/or intermodulation.[29] As one commenter notes, "[n]othing

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[27] *See, e.g.*, Comments of Ad Hoc Wireless at 4, 7; Aeronautical Radio, Inc. ("Aeronautical Radio") at 4; American Electric Power Company ("American Electric") at 4-6; API at 10-13; ARINC *et al*. at 26; AT&T at 18-21; AVR, Inc. ("AVR") at 2-3; Baltimore City at 6-7; Cingular/ALLTEL at 9-15; CTIA at 4-6; Delmarva at 22-24; Duke at 7-8; E.F. Johnson ("Johnson") at 3; Eastman Chemical Company ("Eastman") at 2; Entergy at 30-50; Exelon at 1-7; FEM Electric Association ("FEM") at 1-2; Fisher Wireless Services, Inc. ("Fisher") at 5-7; Fresno at 13; Hampton at 1-2; Harmer Communications ("Harmer") at 3-4; H-D Electric Cooperative, Inc. ("H-D") at 1-2; Holy Cross Electric Association ("Holy Cross") at 3-5; Intel Corporation ("Intel") at 1-3; Iridium Satellite LLC ("Iridium") at 1; ISG Cleveland Inc. ("ISG") at 3; Jones Onslow Electric Membership Corporation ("Jones") at 3-5; Kenwood at 10; Lockheed Martin Corporation ("Lockheed") at 11-13; Lubrizol Corp. ("Lubrizol") at 1; Motient Communications, Inc ("Motient") at 12-14; NAM at 2-4; New York City Transit Authority ("NYC Transit") at 9-10; Northern Electric Cooperative, Inc. (Northern Electric") at 1-2; Pinnacle West Capital Corporation ("Pinnacle") at 4, 6; Preferred at 8; Questar Corporation ("Questar") at 2; Renville-Sibley Cooperative Power Association ("Renville") at 2; SCANA at 6-7, 21-37; Satellite Industry Association ("SIA") at 3-4; Sid Richardson Energy Services Co. ("Sid Richardson") at 2-4; Skitronics at 4-17; South Dakota Rural Electric Association, Inc. ("SD Rural") at 1-2; South Plains at 1-2; Southern LINC at 44-57; Supreme at 6-19; USCC at 4-5; UTStarcom, Inc. ("UTStarcom") at 1; United Telecom Council ("UTC") at 8-9; Verizon Wireless at 2; Washington Electric Membership Corporation ("Washington Electric") at 3-4; Western Communications, Inc. ("Western") at 1-2; White County Rural Electric Membership Cooperative ("White") at 2-4; Wiztronics, Inc. ("Wiztronics") at 2-3; Xcel Energy Services, Inc. ("Xcel") at 4-5.

[28] *See, e.g.*, Comments of Baltimore City at 1-4, 6-7; DC at 4-6; Maryland Department of Budget and Management, Office of Information ("MD Dept. BM/OI") at 3-5. Even public safety entities expressing some support for Nextel have serious reservations with respect to the hardship it would cause to B/ILT licensees and the limited scope of overall financing. *See* Comments of APCO at 21-22.

contained in the Nextel plan assures that the interference problem will be eliminated," because Nextel's system will remain within the passbands of existing public safety receivers allowing intermodulation to continue.[30] This is true with any 800 MHz rebanding proposal.

Second, the Nextel plan is the most disruptive.[31] It "would relocate not merely a minimal number of affected licensees, but almost every licensee on the band."[32] For B/ILT users generally, it would require "replacement (not the retuning) of *every* piece of equipment related to a licensee's system."[33] For critical infrastructure industry ("CII") providers, like utilities and aviation, it would obviate significant investments in current facilities and require relocation to less effective spectrum bands without available equipment – in effect "a denial of service" that would "jeopardize public safety."[34] These burdens are imposed "without regard to whether

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[29] *See, e.g.*, Comments of ARINC *et al*. at 15 & n.8; American Electric at 5; AT&T at 18; Cingular/ALLTEL at 13; CTIA at 4-5; Federated Rural Electric ("Federated") at 2; Fresno at 4; Ft. Lauderdale at 4-5; Lockheed at 12; National Rural Electric Cooperative Association ("NRECA") at 9-11; SCANA at 20-21; TRW/Ohio MARCS Program Office ("TRW") at 1; UTC at 10; Verizon Wireless at 12-13; White at 2.

[30] Comments of American Electric at 5.

[31] *See, e.g.*, Comments of Ad Hoc Wireless at 4; American Electric at 4; API at 10-12; Delmarva at 23; ISG at 3; Jones at 3-5; Kenwood at 10; Motient at 13; NYC Transit at 9-10; Northern Electric at 2; Renville at 2; SCANA at 21-25; SIA at 3-4; UTC at 8; Western at 2; White at 2-3.

[32] Comments of Delmarva at 23; *see also* Comments of American Electric at 5; Entergy at 30.

[33] Comments of Ad Hoc Wireless at 4 (emphasis added); *see, e.g.*, Comments of American Electric at 4.

[34] Comments of Aeronautical Radio at 4; Duke at 4; *see also* Comments of API at 10-11; Exelon at 5-6; Pinnacle at 4. CII licensees unanimously reject Nextel's proposal to remain in the 800 MHz band on a secondary basis as a non-viable option due to the critical nature of the services they provide. *E.g.*, Comments of API at 10-11; Delmarva at 39-40; Entergy at 43-44; Exelon at 5-6; FEM at 2; Holy Cross at 4; Northern Electric at 2.

[these] providers are actually causing interference."[35] Even for public safety licensees remaining within the band, retuning and possibly replacement of equipment would be required.[36]

Third, the Nextel plan is the most self serving, characterized by many as a "spectrum grab."[37] It would give Nextel, the primary causer of public safety interference, vastly improved spectrum holdings for free, while requiring other licensees, which have not been shown to cause interference, to move without compensation.[38] Moreover, under *Ashbacker* and its progeny, vacant channels must be made available for competing applications unless a voluntary exchange of like frequencies between two licensees is contemplated, which is not the case here.[39] Nextel's attempt to obtain for free more valuable contiguous nationwide spectrum in exchange for less valuable (more congested) interleaved spectrum is a windfall, not a one-for-one swap; Section 309(j) of the Communications Act requires such spectrum rights to be auctioned.[40] As one CII commenter explains:

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[35] Comments of AT&T at 19; *see* Comments of Entergy at 25.

[36] *See, e.g.*, Comments of Baltimore City at 3.

[37] *See, e.g.*, Comments of American Electric at 5; AT&T at 20-21; Carolina at 6-8; Cinergy at 31-32; Cingular/ALLTEL at 11-13; Delmarva at 9, 22; Entergy at iv, 25; Exelon at 6; Fisher at 5-7; Fresno at 2; Kenwood at 10; Questar at 2; Skitronics at 4; South Plains at 1; USCC at 4; Verizon Wireless at 2.

[38] *See, e.g.*, Comments of Entergy at 25; Exelon at 6-7.

[39] *See, e.g.*, Comments of Carolina at 12-13 (citing *Ashbacker Radio Corp. v. FCC*, 326 U.S. 327 (1945); *Rainbow Broadcasting Co*., 949 F.2d 405, 408 (1991)); *see also* Comments of Southern LINC at 50-56; UT Starcom at 2-5.

[40] *See, e.g.*, Comments of Boeing at 32; Carolina at 6-8; Cingular/ALLTEL at 11-13; CTIA at 5; Delmarva at 40-42; Fresno at 13; Iridium at 3; Lockheed at 12; Motient at 14; Southern LINC at 50-56; Supreme Radio at 17-19; USCC at 4-5; Verizon Wireless at 13-15. Section 309(j) requires the Commission to grant a license or permit to a qualified applicant only through a system of competitive bidding, unless there are no mutually exclusive applications or
(continued on next page)

> While other licensees would presumably have to spend millions, or even billions, to obtain suitable spectrum at auction, Nextel would acquire it in exchange for less valuable spectrum in an already congested band. This maneuver would require the FCC to ignore established spectrum allocation principles for the sole purpose of enriching a single company at the expense of fair competition. Thus, *Nextel's proposal is nothing more than a spectrum grab that would blatantly contradict the public interest and would undermine sound spectrum policy*.[41]

Finally, the Nextel plan is time consuming and imposes costs on licensees that do not cause interference.[42] It would "impose billions of dollars of costs on American businesses" and would be an "unmitigated disaster from an operational and financial standpoint for America's industrial, transportation and utility sectors."[43] Those costs are estimated to be between $1 billion and $5 billion.[44] In fact, it may force some B/ILT or SMR licensees out of business or cause them to lose their investment.[45] Even with respect to public safety, Nextel's proposed

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the licenses fall within certain exceptions not applicable to Nextel. *See* 47 U.S.C. § 309(j). As Cingular/ALLTEL explained in their comments, "[u]nder any other scenario, Nextel would have to bid for such valuable spectrum rights, and there can be no doubt multiple applicants would apply to use the spectrum it seeks. Accordingly, any award to Nextel of the spectrum it seeks without an auction would be contrary to Section 309(j)." Comments of Cingular/ALLTEL at 12.

[41] Comments of Delmarva at 42; *see* Comments of Entergy at 48.

[42] *See, e.g.*, Comments of East River Electric Power Cooperative, Inc. ("East River") at 2-3; Fairfax at 4; Federated at 2; Fedex at 1; ISG at 3; Jones at 3-5; Motient at 13; SIA at 4; Southwest Louisiana Electric Membership Corp. ("Southwest Louisiana") at 4; White at 2.

[43] Comments of API at 11 (citing *Notice* at ¶ 44 & n.117).

[44] *See, e.g.*, Comments of APCO at 25 (approximately $1 billion); C & M at 2 (approximately $2 billion); Paul Choc ("Choc") at 1 (approximately $3 billion); County of Maui, Hawaii ("Maui") at 6 (approximately $5 billion); Motorola, Inc. ("Motorola") at 24 (approximately $2.8 billion); *see also* Comments of ARINC *et al.* at 23 (noting that Motorola's suggested figure of $1 billion underestimates actual costs).

[45] *See, e.g.*, Comments of ARINC *et al.* at 28; Business Autophones, Inc. ("Business Autophones") at 2; CRT at 3; Coupe Communications, Inc. ("Coupe") at 4.

$500 million contingent contribution would fall far short of covering public safety relocation costs.[46]

### B. No 800 MHz Rebanding Plan Will Solve Public Safety Interference

The record makes clear that other 800 MHz band realignment proposals, *e.g.*, those proposed by NAM and the FCC, also will not resolve all forms of public safety interference; receiver overload and intermodulation will continue due to the wide front-end of current public safety receivers.[47] As API notes, "there seems to be a growing consensus among those who have at least begun to examine the technical evidence that simply rebanding existing licensees within the 800 MHz band . . . could reduce the amount of interference to public safety systems, but . . . certainly would not eliminate it."[48] Thus, "simply moving [public safety] or their fellow licensees around the 800 MHz band will have little effect on receiver overload-caused intermodulation and desensitization."[49] The City of Portland puts it more bluntly: "[t]he band-realignment approach would *not resolve* the interference problems currently being experienced

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[46] *See, e.g.*, Comments of APCO at 22; Comments of Baltimore City at 1; *see also* Comments of Delmarva at 29; Exelon at 6; Supreme at 7-9.

[47] *See, e.g.*, Comments of American Electric at 6; API at 3-5; ARINC *et al*. at 29; AT&T at 18; Cingular/ALLTEL at 13, 15-16; Entergy at 19-20 (citing *Notice* at ¶ 27); Exelon at 3-4 (same); Florida State Technology Office, Bureau of Wireless Communication ("Florida State") at 2 (same); Ft. Lauderdale at 4; Fresno at 4; NAM at 3-4; NYC Transit at 10; Portland at 9; South Plains at 2; Southern LINC at 57; TRW at 1-3; Verizon Wireless at 8; *see also* Comments of Private Wireless Coalition at 7.

[48] Comments of API at 5.

[49] Comments of AT&T at 18.

by the Portland mobile data system."[50] Commenters therefore agree that "to reconfigure the 800 MHz band is simply to gloss over a problem rather than to address and solve it."[51]

To different degrees, all 800 MHz rebanding plans would also be difficult, protracted, costly and disruptive.[52] For example, the Ad Hoc Wireless Alliance notes that for SMR or private 800 MHz users, any relocation within the 800 MHz band would require modification of *every* base station and mobile unit, causing a "staggering" loss of productivity and "irreparable" customer harm.[53] These costs would be magnified for utilities with extensive wide area systems.[54] Public safety licensees also emphasize that such proposals would entail "a complete restructuring" of their radio systems and force a "massive programming effort" that would strain critical resources.[55] While the costs involved with any rebanding proposal may be less than those associated with Nextel's plan, they are still estimated to be significant, *e.g.*, $250 million according to one estimate.[56] Even after any in-band retuning/relocation has been completed, all

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[50] Comments of Portland at 9.

[51] Comments of South Plains at 2.

[52] *See, e.g.*, Comments of Ad Hoc Wireless at 3-4; American Water at 2; AT&T at 19; Baltimore County at 1-2; Carolina at 20; Cingular/ALLTEL at 9; Delmarva at 17-19; Entergy at 20-22; King at 2; Kenwood at 10, 12; NAM at 5; NYC Transit at 9; TRW at 4; Xcel at 3, 5.

[53] Comments of Ad Hoc at 3.

[54] *See, e.g.*, Comments of Delmarva at 18; Xcel at 3.

[55] Comments of Baltimore County at 1; *see* Comments of NYC Transit at 9.

[56] *E.g.*, Comments of NAM at 5. For some, modification of existing equipment would not be enough; they would have to buy and deploy new equipment, which could "render potentially billions of dollars worth of equipment useless." *E.g.*, Comments of Delmarva at 18; Entergy at 20; *see also* Comments of AT&T at 19.

800 MHz licensees would be required to re-coordinate frequency uses with their new neighbors – a time consuming process.[57]

Finally, in order to implement any of the rebanding proposals, a potentially complicated series of steps will be needed. Certain spectrum will need to be identified and set aside as "green space" to ensure that licensees are able to remain fully operational during the transition.[58] This step is necessary so that a system ("System A") can move to temporary open frequencies ("green space") and remain operating while another system ("System B") assumes its vacated frequencies. Once the move is complete, System A may then move its operations to the frequencies formerly occupied by System B. Without green space, System A would be forced to shut down during any transition. As a result, "licensees might have to relocate over and over again in a daisy chain effect, as each move requires another."[59] Because most existing 800 MHz frequencies, particularly those in urban areas, are currently in use, however, "there seems to be no reasonable way to accomplish a rebanding without someone having to move out."[60] For all these reasons, the proposed 800 MHz rebanding proposals do not represent the best solution to public safety interference.

### C. Immediate Steps Should Be Taken To Address Interference

Commenters agree that because of the necessary time-frame for implementing the proposals put forth in this proceeding, including the 700 MHz band proposal advocated below,

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[57] Comments of AT&T at 19.

[58] *See, e.g.*, Comments of Johnson at 2; King at 2; Portland at 9, 13.

[59] Comments of Carolina at 20.

[60] Comments of King at 2.

certain steps are necessary to address interference to public safety systems in the near-term. Such steps should include: (i) utilization of the mitigation techniques set forth in the *Best Practices Guide*[61]; (ii) improvements in public safety handsets to improve filtering and rejection of intermodulation products, (iii) the ability to negotiate and obtain FCC approval of spectrum swaps or rechannelization agreements, where necessary; and (iv) continued documentation of cases of interference and the methods used to alleviate that interference.[62] Using such methods, affected parties will be able to effectively resolve most cases of interference on a local, case-by-case basis.

### D. Reallocation of Upper 700 MHz Is the Best Long-Term Solution

Commenters agree with the substantial number of parties who advocate reallocating the upper 700 MHz band (channels 60 – 69) to public safety, and relocating 800 MHz public safety licensees to the 700 MHz band, as the best long-term solution to public safety interference. These parties include representatives of all interested groups, including public safety,[63] private

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[61] Cellular carriers should not be required to participate in the extensive frequency coordination requirements outlined in the *Guide*, since they are responsible for only a very small part of the interference experienced by public safety users.

[62] *See, e.g.*, Comments of Access Spectrum at 6, 8; American Mobile Telecommunications Association ("AMTA") at 7; AT&T at 14-17; Boeing at 20-21; Cingular/ALLTEL at 19-20; NAM at 4; Private Wireless Coalition at 12-13; Verizon Wireless at 9-10; *see also* Comments of Southern LINC at 22-27.

[63] *See, e.g.*, Comments of Austin at 1 (believes Cingular proposal to move public safety to 700 MHz would be effective, but concerned with costs/logistics); Bergen County Police Department ("Bergen") at 6 (citing Cingular proposal, suggests FCC place public safety frequencies up for competitive bidding and direct revenues to fund relocation); College Station at 2 (believes Cingular proposal to move public safety to 700 MHz would be effective, but concerned with costs/need for solution to B/ILT interference); Madison County East Transit District ("Madison") at 9 (proposals to relocate public safety to 700 MHz in lieu of holding Auction 31 must be seriously considered); Portland at 10, 13 (believes a long-term zero tolerance
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wireless,[64] commercial wireless,[65] satellite,[66] and manufacturers and consultants.[67] A significant component of this plan is the auctioning of vacated 800 MHz spectrum to help pay for relocation of public safety and fund the acquisition of new public safety equipment or equipment upgrades.

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interference solution may require moving public safety to public safety only frequency band, which would require legislative action); Snohomish County Emergency Radio System ("Snohomish") at 2 (proposals that include fully funded relocation to 700 MHz may have significant merit).

[64] *See, e.g.*, Comments of Ad Hoc Wireless at 3 n.3 (supports plan of Coalition for Constructive Public Safety Interference Solutions to move public safety out of 800 MHz and pay for the move with auction revenues of vacated spectrum); Aeronautical Radio at 1 (supports Private Wireless Coalition 700 MHz proposal); API at 6 (relocating public safety to 700 MHz should be considered, but is not a near-term solution because of need for legislation and disruption to public safety); Blooston, Mordkofsky, Dickens, Duffy & Pendergrast ("Blooston") at 4 (suggesting reallocation to 700 MHz as an alternative to reconfiguring 800 MHz); Business Autophones at 2 (describes reservation of 700 MHz for public safety as a "real opportunity"); Coupe at 3 (believes public safety best served by relocation, possibly 700 MHz); Fisher at 3 (support Private Wireless Coalition proposal to move public safety to 700 MHz as a long-term solution); NAM at 6 (supports Private Wireless Coalition proposal, emphasizing that relocation to 700 MHz as distinct from in-band retuning provides a complete solution to interference); Private Wireless Coalition at 2, 7-12 (offers a long-term proposal to relocate public safety to 700 MHz); South Plains at 2 (supports Cingular proposal to move public safety to 700 MHz).

[65] *See, e.g.*, Comments of AT&T at 10-14 (supports proposal of Coalition for Constructive Public Safety Interference Solutions); Cingular/ALLTEL at 16-19 (supports proposal of Coalition for Constructive Public Safety Interference Solutions); CTIA at 6, 9 (proposes long-term plan to relocate public safety to 700 MHz); Fresno at 3, 7 (believes public safety should be relocated to 700 MHz); Jamestown at 5-6 (supports relocation of public safety to 700 MHz); Southern LINC at 14 (supports relocating public safety to 700 MHz).

[66] *See, e.g.*, Comments of Boeing at ii, 16-19 (supports proposal of Coalition for Constructive Public Safety Interference Solutions as the best solution available); SIA at 3 (supports 700 MHz proposals); Lockheed at 5 (supports Private Wireless Coalition proposal to move public safety to 700 MHz); Motient at 16-21 (supports Cingular proposal to move public safety to 700 MHz because it would serve all of the FCC's goals).

[67] *See, e.g.*, Comments of Kenwood at 11-12 (moving public safety to 700 MHz is the only way to solve interference); Motorola at 6 (believes additional 700 MHz allocations for public safety and private wireless could be part of long-term solution); RCC Consultants ("RCC") at 4-5 (advocates allocating the entire 700 MHz band for public safety communications).

Collectively, the comments point to the 700 MHz band as offering the only complete solution to public safety interference. As Cingular/ALLTEL noted in its comments, this proposal, if fully implemented, provides numerous benefits. For public safety licensees, interference will be resolved; they will gain 30 MHz of additional spectrum nationwide (20.5 MHz net); auction proceeds will help fund relocation and equipment upgrades; and public safety interoperability, Priority Access Services and other Homeland Security needs will be facilitated. For conventional SMR and B/ILT licensees, there will be no relocation or relocation costs, and they will gain access to additional spectrum contiguous to their current spectrum assignments. For Nextel, interference with public safety will be eliminated, relocation costs (compared to its plan) will be reduced, and it can bid for additional spectrum. Finally, cellular licensees will be able to compete at auction for additional contiguous spectrum.

While the proposal does require legislation,[68] given the breadth of support for this plan from public safety, SMR, private wireless, satellite and commercial wireless it can be accomplished. In fact, Congress recently noted the possibility of a 700 MHz band solution to public safety interference when it passed the Auction Reform Act of 2002, which removed all deadlines with respect to the auctioning of upper 700 MHz band spectrum this year (other than to require that auctions be conducted before the FCC's auction authority expires in 2007). Instead, the Act directed the Commission *not* to auction the spectrum until a tenable plan to solve 800 MHz interference issues has been developed:

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[68] Specifically, it will be necessary to work with Congress to enact legislation (i) reallocating 30 MHz of spectrum currently allocated for commercial use to public safety (excludes 6 MHz of guard band spectrum already auctioned); (ii) targeting auction revenues to help fund public safety relocation; and (iii) requiring broadcasters to exit the upper 700 MHz band by December 31, 2006 or sooner.
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> The Federal Communications Commission is also in the process of determining how to resolve the interference problems that exist in the 800 megahertz band, especially for public safety. One option being considered for the 800 megahertz band would involve the 700 megahertz band. *The Commission should not hold the 700 megahertz auction before the 800 megahertz interference issues are resolved or a tenable plan has been conceived*.[69]

By directing the Commission to delay any auction of the upper 700 MHz band because of the possibility the band could provide a solution to public safety interference, Congress has opened the door to possible future legislative activity if warranted by the outcome of this proceeding. While these efforts may take time, it will be no longer that the amount of time required to implement any 800 MHz rebanding proposals.[70]

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[69] Pub. L. No. 107-195, 116 Stat. 715, sec. 2(4) (2002) (emphasis added).

[70] *See* Comments of AT&T at 19-20.

## CONCLUSION

For the foregoing reasons, the Commission should adopt the rules and policies expressed herein.

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